

SUPPLEMENT TO THE PRELIMINARY ENGINEERING REPORT
Quality Control Checklist for Preliminary Engineering Reports

Name of Water/Wastewater Facility

Name of Engineering Firm

Name of Purveyor (Owner or System Contact)

Name of PE on PER Documents

Mailing Address

Mailing Address

City State Zip

City State ZipType of Project (Check all that apply)

- ☐ Booster Pump Stations
- ☐ Sewer Treatment
- ☐ Transmission mains and distribution systems
- ☐ Well Renovation
- ☐ Storage
- ☐ Water Treatment
- ☐ Well Construction
- ☐ Wastewater Collection System
- ☐ Wastewater Treatment/Disposal
- ☐ Other _____
- ☐ Site Visit with Funding Agency Representative, Owner Representative and Consulting Engineer completed.
Meeting minutes attached.

CDBG Approval

State Revolving Loan Funds Concurrence

AB 198/237 State Grant Concurrence

PE's Seal

Engineers Signature Date

Rural Development Concurrence

Growth Projections – All Projects

All Preliminary Engineering Reports for Water and Wastewater projects must contain the following:	Completed	N/A	Pg Referenced
If growth forecasts exceed 1%, the engineer must consider a multitude of factors that lead to increasing/decreasing population/demand. These factors include economic conditions/outlook for core industries (e.g. mining), regional and shrinkage trends, new building permits, increasing/decreasing school enrollment, etc.			
If growth cannot be forecast with certainty, a phased approach shall be considered for each reasonable alternative.			
Customer commitment to the project must be identified based on the <u>existing</u> population. This section should also identify means that will be utilized to encourage customer/population commitment and participation to the project.			
If there is a proposed change to the district service area, governing law must be fully researched and comments received from County DA/legal counsel, and any costs associated with expansion should be included in the project.			
If there are small water or wastewater systems within the boundaries of the service area, does the PER address how these system will or can be connected, and at what cost? Is consolidation of service area being considered?			
Does the applicant own adequate water rights to support the project?			

Miscellaneous Information – All Projects

All Preliminary Engineering Reports for Water and Wastewater projects must contain the following:	Completed	N/A	Pg Referenced
Accessibility – are the applicant's customer service facilities fully accessible and in compliance with the Uniform Federal Accessibility Standards, and the Americans with Disabilities Acts guidelines? If not is the cost to bring in compliance included in the report?			
Include a map indicating ownership of the land impacted by the proposed project.			
Feature Locations – provide the coordinates (Lat/Long,) of major features (tanks, wells, sources, utility headquarters etc..) The preferred format is NAD 83, ddd.ddddd. Note any common format is acceptable, EXCEPT Start Plane Coordinates.			

Cost Estimates – All Projects

All Preliminary Engineering Reports for Water and Wastewater projects must contain the following:	Completed	N/A	Pg Referenced
Construction estimates must be based on the anticipated mid-point of construction and developed in considerable detail. Major equipment items such as stand-by generators, SCADA systems, etc., must be listed and estimated separately. Facility costs should be based on square footage as depicted in a floor plan sketch. It may be necessary to include an equipment layout on the sketch. Prices (unit and lump sum) should take into consideration procurement methods. Include the basis of unit price costs (means, previous bids in locality, etc.). Does the operation have all necessary equipment to operate the facility, including a computer billing system?			
The scope of all non-construction costs (legal, administrative, interim financing, title companies, land acquisition, bond counsel, etc.) must be defined before costing the item; percentages of construction costs are not acceptable.			
Engineering costs should be based on a percentage of construction costs with written justification.			
Construction contingencies should be between 5% and 10%. Detailed written justification must be made for contingencies outside of this range.			
Include the costs of land acquisitions; private, BLM, FS. If there is on-going annual costs associated with this acquisition or lease it should be included in the annual O&M costs.			
Include cost estimate for O&M cost impacts reductions or increases based on system improvements.			
Include cost impacts of other funding (i.e. AB 198 capital replacement)			
Decision Matrix – provide a matrix or table. The Matrix should include environmental considerations, capital costs, present worth costs, constructability, needs of the applicant and other pertinent issues.			

Financial Data – All Projects

All Preliminary Engineering Reports for Water and Wastewater projects must contain the following:	Completed	N/A	Pg Referenced
Provide applicants 5-10 year capital plan. If a plan is not available how is the applicant addressing long term capital needs?			
Include 3 years of audited financial statements, combined balance sheets, and statements of revenues, expenditures cannot be used.			
Conversion on water usage must be based on ERU or EDU – users must be broken out into residential vs. commercial – must have a chart of actual usage per category.			
Current rate schedule and any anticipated rate schedule adjustments for all tiers of service. Include connection charges and policy on late payments, discontinuation and restoration of service. Include date and amount of last rate change.			
All information on all outstanding debt must be included; to whom owed, original amount owed, current balance, terms, interest rate, annual installment, due date, required reserve accounts.			
Short-Lived Asset Replacement schedule; to include 1-15 year items, broken out as 1-5 year, 5-10 year, and 10-15 year life cycle.			

Condition of Existing Facilities - Water Projects

All Preliminary Engineering Reports for Water projects must contain the following:	Completed	N/A	Pg Referenced
The Number and type of maintenance and repairs undertaken, backlogged, and/or forecast to keep the present facilities operating at required capacity.			
Circuit Rider reports must be included when referenced in PER.			
Supply – Rough evaluation of current water quality, aquifer condition, well condition, capacity, reliability and electrical and mechanical components of the water supply. This information may be available from Circuit Riders and Local Operators. <i>(Intended to be a rough survey to determine if further investigation is required.) A copy of the most recent water quality analysis and consumer confidence report must be included.</i>			
Treatment – Evaluate existing condition and effectiveness of treatment system.			
Distribution –If improvements are recommended to the distribution system, evaluate the condition of the existing system - a hydraulic model may be required – See Hydraulic Model requirements in this attachment. Verify all services are metered, if not metered must be included as cost in the PER to install meters.			
Pump Stations – Evaluate the condition of pump station(s). Specifically evaluate the existing condition of the electrical, mechanical and control systems. In addition, analyze existing head and flow conditions against pump curve. <i>(Intended to be a rough survey to determine if further investigation is required.)</i>			
Evaluate system vulnerability to power outages and make recommendations concerning back-up power.			
If water usage exceeds 200 gdpcc, provide rationale for high water usage.			
Provide one page schematic of supply, pumping, and storage system complete with pumping elevations and rates, well head elevations, and storage capacities and elevations.			
Include map showing boundary lines, proposed system improvements, existing system, wells, and tanks locations. Include crossings of major roads, highways, watercourses, railroads, etc.			

Water Supply

All Preliminary Engineering Reports for Water projects must contain the following:	Completed	N/A	Pg Referenced
Detail all changes which may impact water rights. If additional water rights are required, provide detailed discussion of alternative sources of supply. In addition, for additional water rights, a contract must be secured from the Owner of those water rights defining the terms under which those water rights may be purchased. (Note that contracts must have option to execute for at least two years)			
A narrative concerning the water supply quality must be included.			

All Preliminary Engineering Reports for Water projects must contain the following:	Completed	N/A	Pg Referenced
<u>Water Source Type</u> † Purchase Contract † Off-Stream Reservoir † Wells † Lake Intake † Spring † River Intake			

Reservoirs and Storage Tanks

All Preliminary Engineering Reports for Water projects must contain the following information when new reservoirs/tanks are proposed; or when tank/reservoir renovation or modification is proposed.	Completed	N/A	Pg Referenced
Provide sizing analysis based on combined volume of operating, emergency reserve, and fire suppression storage.			
Statutory deficiencies must be based on NAC 445A.6674* for <u>existing</u> water systems if the public water system has operated for more than 5 years.			
If tank coating or replacement recommended, please provide inspection report complete with photographs.			
If new storage tank location is being proposed, provide a title search assessment of the property ownership of the proposed site.			

Transmission And Distribution

PER's which recommend changes/expansions/improvements to the transmission/distribution must include the following:	Completed	N/A	Pg Referenced
System Analysis documenting the availability of adequate source and storage to serve the proposed service. Including a hydraulic analysis for the proposed project if greater than 6" diameter looped system, or 8" straight pipe. See Hydraulic Model requirements attached.			
Provide water distribution map showing location of water lines, pipe sizes, type of pipe, pressure zones.			
Number of miles of transmission, distribution lines in system			
<p style="text-align: center;"><u>Water Distribution Type – Must Be Completed</u></p> <p>† Full Fire Flow</p> <p>† Partial Fire Flow</p> <p>† Demand Flow Only</p> <p>† Average Flow</p> <p>† Cluster</p> <p>† Individual</p>			

Water Treatment Systems

PER's which recommend changes/expansions/improvements to Water Treatment Systems must include the following:	Completed	N/A	Pg Referenced
Include back-up documentation from State BHPS, NDEP, Discharge Permits, Water Quality Reports, etc.			
Include O & M costs for waste handling and waste disposal costs.			
<p style="text-align: center;"><u>Water Treatment Type – Must Be Completed</u></p> <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;">↑ Aeration</div> <div style="width: 50%;">↑ Clarification</div> <div style="width: 50%;">↑ Filtration</div> <div style="width: 50%;">↑ Taste/Order Control</div> <div style="width: 50%;">↑ Softening</div> <div style="width: 50%;">↑ Trace Organics</div> <div style="width: 50%;">↑ Removal of Inorganics</div> <div style="width: 50%;">↑ Electro dialysis</div> <div style="width: 50%;">↑ Coagulation</div> <div style="width: 50%;">↑ Disinfection</div> <div style="width: 50%;">↑ Iron/Manganese</div> <div style="width: 50%;">↑ Reverse Osmosis</div> </div>			

Hydraulic Water Modeling Requirements

If proposed pipe is larger than 6”in diameter for a looped system, or 8”in diameter for a straight pipe then include the following:	Completed	N/A	Pg Referenced	
Provide Calibrated Hydraulic Water Model per table below. The calibrated model shall then be utilized to model the proposed improvements and all pressure zones impacted by proposed improvements.				
Minimum Criteria for Planning Level Hydraulic Network Modeling				
Type of Time Simulation	Number of Pressure Readings	Accuracy of Pressure Readings	Number of Flow Readings	Accuracy of Flow Readings
Steady-State or EPS	10% of Nodes on Larger Diameter Pipes	+/- 5 Psi for 100% of Readings	1% of Pipes	+/- 10%

Condition of Existing Facilities (Wastewater Projects)

All Preliminary Engineering Reports for Wastewater projects must contain the following.	Completed	N/A	Pg Referenced
The Number and type of maintenance and repairs undertaken, backlogged, and/or forecast to keep the present facilities operating at required capacity.			
Circuit Rider reports must be included when referenced in PER.			
Collection System – Describe age, condition, and materials of sewer collection system. For projects recommending replacement or renovation of collection system, evidence must be provided via inspection reports, video survey, or other documented means.			
Pump Stations – Evaluate the condition of pump station(s). Specifically evaluate the existing condition of the electrical, mechanical and control systems. In addition, analyze existing head and flow conditions against pump curve. <i>(Intended to be a rough survey to determine if further investigation is required.)</i>			
Compare wastewater inflows with water usage and explain any discrepancies.			
Provide one page schematic of pumping and treatment complete with pumping elevations and rates, discharge elevations, and plant inflow elevations, and existing pipe slopes and elevations.			
Include map showing boundary lines, proposed system improvements. Existing system, treatment plant, manholes and crossings (per water).			

Wastewater Collection Improvements

All Preliminary Engineering Reports for Wastewater projects must contain the following.	Completed	N/A	Pg Referenced
Provide detailed hydraulic calculations for sewer lines in excess of 8" in Diameter.			
Investigate slip lining and other trenchless pipe renovation technology as alternative.			
Number of miles of lines in system			
<p style="text-align: center;"><u>Wastewater Collection Type – Must Be Completed</u></p> <div> <div> † Conventional Gravity † Small Diameter Gravity † Hauling </div> <div> † Effluent Pumps † Vacuum </div> </div>			

Wastewater Treatment/Disposal

All Preliminary Engineering Reports for Wastewater projects must contain the following, if improvements to the wastewater treatment/disposal are recommended:	Completed	N/A	Pg Referenced																																																			
Provide back-up documentation from Sate Health, NDEP, or State Engineer (SWDA, CWA, Discharge Permits/violations, Test Well																																																						
Monitoring Reports, Water Quality Reports.																																																						
Investigate as alternatives, pressure sewer, vacuum sewer, small diameter gravity sewer, STEP.																																																						
Analyze Infiltration and Inflow.																																																						
Address agricultural and other reuse, and constructed wetlands where applicable.																																																						
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